



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,900	11/26/2003	Francois Le Maut	FR920020049US1	2917
25799	7590	12/28/2009		
IBM CORPORATION PO BOX 12195 DEPT YXSA, BLDG 002 RESEARCH TRIANGLE PARK, NC 27709			EXAMINER HOUSHMAND, HOOMAN	
			ART UNIT 2465	PAPER NUMBER
			NOTIFICATION DATE 12/28/2009	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

RPSIPLAW@US.IBM.COM

Office Action Summary

Application No.

10/722,900

Applicant(s)

LE MAUT ET AL.

Examiner

HOOMAN HOUSHMAND

Art Unit

2465

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-14, 16-20, 22-30 is/are rejected.
- 7) ☒ Claim(s) 10, 15 and 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB06)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Applicant's remarks and amendments filed 09/13/2009 have been fully considered.
2. Claims 1, 6-8, 11, 14, 16, 20, 25-28, 30 have been amended. Claims 1-30 are pending.

Specification

3. The abstract of the disclosure is objected to because of grammatical errors. Amended abstract (on page 14 of the response) third line recites "*re-sequence*" - it appears -- re-sequenced -- was intended. The next to last line (line 14) recites "*process*" - it appears -- processed -- was intended.. Correction is required. See MPEP § 608.01(b).

Claim Objections

4. Claims 1-9, 11, 13-17, 19, 20, 22, 23, 28 and 29 are objected to because of the following:

Claims 28: The preamble

"A program product comprising: a computer readable medium encoded with computer readable code,"

Art Unit: 2465

should be rewritten as:

-- A computer readable medium embodied with a computer program product having computer readable code, --

Claims 29, line 1: "*program product*" should be changed to -- computer readable medium --.

All claims: All numbers within parentheses should be deleted from the claims to avoid any confusion.

In claim 1, line 13, "allocation" should be changed to --allocating--.

The dependency for claim 6 should be claim 2 only, instead of claims 1 or 2 since the term of "a second Content Addressable Memory" would not make sense if depends on claim 1.

In claim 16, line 2, "the data products", line 14, "the packet sequence number", each lacks antecedent basis.

In claim 20, line 2, "the unused Cross Reference Index" lacks antecedent basis.

In claim 22, line 2, "furthercomprising" should be --further comprising--,

lines 2-3 "the source identifier", line 3 "the priority level", each lacks antecedent basis.

The dependency of claim 23 is improper. It cannot depend on a system claim or a method claim. It appears that the dependency on claim 1 was intended.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 11 (as dependent on 1), 13, 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Salamat (US 20030012200 A1), in view of Sasagawa (US 20080253379 A1).

Claim 1. Salamat teaches ([0010] receiving and re-sequencing out-of-order data packets, comparison against threshold levels of sequence numbers associated with packets already received and successfully sequenced. range of sequence numbers up to a predetermined threshold. memory space to store a sequence and compare it against incoming data packets) *a system for re-sequencing per flow data packets received by at least one destination egress side comprising:*

a plurality of output registers with each register dynamically assigned to store received data packets from one of a plurality of flows ([0010] the memory space to store a sequence, [0028] sequence space in the form of memory 94 which is allocated for storing sequence numbers of data packets received by the egress board 40, [0037] the egress board 40 to store the data packet, [0039] resequencing engine 82 can perform operations on 64 distinct traffic streams. On any given stream, the sequence number for the last packet successfully resequenced is stored);

means for allocating a temporary storage location in a packet buffer to each received data packet;

means, using predefined parameters, for pointing to an output register previously assigned to corresponding flow ([0039] perform operations on 64 distinct traffic streams); and means coupled to the allocation means and to the pointing means for determining if each received data packet is the next in sequence of the corresponding flow, by comparing the packet sequence number of said each received data packet to the last packet sequence number used by the pointed output register ([0012] system including an ingress side, an egress side, handling data packets received at the egress side. egress side of the system receiving an out of sequence data packet, a re-sequencing engine of the system measures the distance between the sequence number associated with the out of sequence data packet and the sequence number of the last packet that was received in sequence. The re-sequencing engine discards or re-sequences the received data packet based on a predetermined threshold level of

distance, the threshold level of distance being a function of the amount of memory in the system that is available for re-sequencing data packets).

Salamat does not teach *egress adapter*.

In the same field of endeavor, Sasagawa discloses ([0043] egress adapter terminates MPLS in the packet router; this packet router is an egress of MPLS) *egress adapter*.

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Sasagawa with Salamat, thus modifying Salamat to include an egress adapter, to specify a variety of routes provided by MPLS.

Claim 11 (as dependent on claim 1). Salamat further teaches *the means for allocating comprise a free buffer list to allocate a free temporary storage location to each received data packet* ([0012] system including an ingress side, an egress side, handling data packets received at the egress side. egress side of the system receiving an out of sequence data packet, a re-sequencing engine of the system measures the distance between the sequence number associated with the out of sequence data packet and the sequence number of the last packet that was received in sequence. The re-sequencing engine discards or re-sequences the received data packet based on a predetermined threshold level of distance, the threshold level of distance being a function of the amount of memory in the system that is available for re-sequencing data packets).

Claim 13. Salamat further teaches *counting means for sequentially numbering data packets of a same flow* ([0012] system including an ingress side, an egress side, handling data packets received at the egress side. egress side of the system receiving an out of sequence data packet, a re-sequencing engine of the system measures the distance between the sequence number associated with the out of sequence data packet and the sequence number of the last packet that was received in sequence. The re-sequencing engine discards or re-sequences the received data packet based on a predetermined threshold level of distance, the threshold level of distance being a function of the amount of memory in the system that is available for re-sequencing data packets).

Salamat does not teach *ingress adapter*.

In the same field of endeavor, Sasagawa discloses ([0014]) *ingress adapter*.

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Sasagawa with Salamat, thus modifying Salamat to include an ingress adapter, to specify a variety of routes provided by MPLS.

Claim 16. Salamat teaches ([0010] receiving and re-sequencing out-of-order data packets, comparison against threshold levels of sequence numbers associated with packets already received and successfully sequenced. range of sequence numbers up to a predetermined threshold. memory space to store a sequence and compare it against incoming data packets) *a method for re-sequencing per flow the data packets*

received by at least one destination egress side comprising: allocating a temporary storage location in a packet buffer to each received data packet; extracting predefined parameters from said each received data packets ([0053] data packet sequence number validations may be performed at regular intervals throughout the duration of a transmission or in real-time, [0051] bit associated with the received data packet, [0050] using bits from the sequence number of the arrived data packet to index into memory) using the predefined parameter to search a memory and identifying a cross reference index; using the Cross Reference Index associated with ([0053] data packet sequence number validations performed in real-time) each received data packet to point to a respective output register previously assigned to the corresponding flow of each received data packet; and comparing the packet sequence number of each received data packet to a packet sequence number stored in the respective pointed output register to determine if said each received data packet is the next in sequence ([0012] system including an ingress side, an egress side, handling data packets received at the egress side. egress side of the system receiving an out of sequence data packet, a re-sequencing engine of the system measures the distance between the sequence number associated with the out of sequence data packet and the sequence number of the last packet that was received in sequence. The re-sequencing engine discards or re-sequences the received data packet based on a predetermined threshold level of distance, the threshold level of distance being a function of the amount of memory in the system that is available for re-sequencing data packets).

Salamat does not teach egress adapter.

In the same field of endeavor, Sasagawa discloses ([0043] egress adapter terminates MPLS in the packet router; this packet router is an egress of MPLS) *egress adapter*.

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Sasagawa with Salamat, thus modifying Salamat to include an egress adapter, to specify a variety of routes provided by MPLS.

Claim 17. Salamat further teaches *assigning a new output register and a new Cross Reference Index if no associated Cross Reference Index is found for a received data packet; and storing in the new output register the packet sequence number of said received data packet* ([0012] the amount of memory in the system that is available for re-sequencing data packets).

Claim 18. Salamat further teaches *checking if the assigned output register is active* ([0012] the amount of memory in the system that is available for re-sequencing data packets).

Claim 19. Salamat further teaches *assigning a new output register if the assigned output register is found inactive; comparing the packet sequence number of the received data packet to the last packet sequence number used by the inactive assigned output register; and storing in the new output register the packet sequence number of*

said received data packet if it is the next in sequence, otherwise storing in the new output register the last packet sequence number used by the inactive assigned output register ([0012] system including an ingress side, an egress side, handling data packets received at the egress side. egress side of the system receiving an out of sequence data packet, a re-sequencing engine of the system measures the distance between the sequence number associated with the out of sequence data packet and the sequence number of the last packet that was received in sequence. The re-sequencing engine discards or re-sequences the received data packet based on a predetermined threshold level of distance, the threshold level of distance being a function of the amount of memory in the system that is available for re-sequencing data packets).

Claim 20. *Salamat further teaches releasing the unused Cross Reference Index after a predetermined time interval ([0053] data packet sequence number validations may be performed at regular intervals), ([0012] re-sequencing engine discards or re-sequences the received data packet based on a predetermined threshold level of distance, the threshold level of distance being a function of the amount of memory in the system that is available for re-sequencing data packets).*

Claim 21. *Salamat further teaches the assigned output registers further comprise a packet buffer identifier that identifies the storage location allocated to each received data packet ([0012] amount of memory in the system that is available for re-sequencing data packets).*

7. Claim 2-9, 11 (as dependent on claim 2), 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Salamat, in view of Sasagawa as applied to claims 1 and 16 above, and further in view of Bryers (US 20030126233 A1).

Claim 2. Salamat does not teach *the means for pointing to an output register comprise a first Content Addressable Memory wherein each entry includes a search field having a source identifier, a routing index and a priority level, and an associated identifier field including a Cross Reference Index to point to a previously assigned output register among a plurality of output registers.*

In the same field of endeavor, Bryers discloses *the means for pointing to an output register comprise a first Content Addressable Memory ([0550] CAM) wherein each entry includes a search field having a source identifier ([0559]), a routing index ([0155]) and a priority level ([0551]), and an associated identifier field including a Cross Reference Index to point to a previously assigned output register among a plurality of output registers.*

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Bryers with Salamat, thus modifying Salamat to include a CAM with specific routing details, to properly provide network services.

Claim 3. Salamat further teaches *packet sequence number equal to the last packet sequence number received for the corresponding flow* ([0010] receiving and re-sequencing out-of-order data packets, comparison against threshold levels of sequence numbers associated with packets already received and successfully sequenced. range of sequence numbers up to a predetermined threshold. memory space to store a sequence and compare it against incoming data packets).

Salamat does not teach *the identifier field further contains an activity identifier to indicate when a previously assigned output register is no longer active*.

In the same field of endeavor, Bryers discloses *the identifier field further contains an activity identifier to indicate when a previously assigned output register is no longer active* ([0161] active traffic).

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Bryers with Salamat, thus modifying Salamat to include a CAM with specific routing details, to properly provide network services.

Claim 4. Salamat does not teach *the means for pointing further comprise means for providing (assigning) a new output register to each new flow of data packets*.

In the same field of endeavor, Bryers discloses *the means for pointing further comprise means for providing (assigning) a new output register to each new flow of data packets* ([0161] active traffic).

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Bryers with Salamat, thus modifying Salamat to include a CAM with specific routing details, to properly provide network services.

Claim 5. Salamat does not teach *the first Content Addressable Memory further comprises means for preventing over filling of said first Content Addressable Memory.*

In the same field of endeavor, Bryers discloses *the first Content Addressable Memory further comprises means for preventing over filling of said first Content Addressable Memory ([0550] CAM).*

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Bryers with Salamat, thus modifying Salamat to include a CAM with memory management, to properly provide network services.

Claim 6. Salamat further teaches ([0010] receiving and re-sequencing out-of-order data packets, comparison against threshold levels of sequence numbers associated with packets already received and successfully sequenced. range of sequence numbers up to a predetermined threshold. memory space to store a sequence and compare it against incoming data packets) *the packet sequence number of each stored data packet.*

Salamat does not teach a *second Content Addressable Memory wherein each entry including a source identifier, a routing index, a priority level of each stored data packet, and an associated identifier field to give a packet buffer identifier that identifies the storage location allocated to each received data packet.*

In the same field of endeavor, Bryers discloses a *second Content Addressable Memory ([0550] CAM) wherein each entry including a source identifier ([0559]), a routing index ([0155]), a priority level ([0551]) of each stored data packet, and an associated identifier field to give a packet buffer identifier that identifies the storage location allocated to each received data packet.*

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Bryers with Salamat, thus modifying Salamat to include a CAM with specific routing details, to properly provide network services.

Claim 7. Salamat further teaches ([0010] receiving and re-sequencing out-of-order data packets, comparison against threshold levels of sequence numbers associated with packets already received and successfully sequenced. range of sequence numbers up to a predetermined threshold. memory space to store a sequence and compare it against incoming data packets) *the output registers further comprise: a packet sequence number and a packet buffer identifier for an in-process data packet.*

Salamat does not teach a *valid-bit latch to set an active/not active status that indicates if the in-process data packet is already output.*

In the same field of endeavor, Bryers discloses *a valid-bit latch to set an active/not active status that indicates if the in-process data packet is already output* ([0161] active traffic).

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Bryers with Salamat, thus modifying Salamat to include a CAM with specific traffic control details, to properly provide network services.

Claim 8. Salamat further teaches *the output register further comprises a counter* ([0030] counter 96, the amount of sequence space, such as memory 94, available) *to maintain a value for, each flow, the number of data packets stored in the packet buffer waiting to be transmitted* ([0052] memory is limited and when multiple paths are used to transmit the data packets from an origination terminal to a destination terminal, [0032] Sequence numbers are inspected by the egress board 40 upon receipt for each data packet and reassembled according to sequence number to assure it is properly constructed and transmitted), ([0012] system including an ingress side, an egress side, handling data packets received at the egress side. egress side of the system receiving an out of sequence data packet, a re-sequencing engine of the system measures the distance between the sequence number associated with the out of sequence data packet and the sequence number of the last packet that was received in sequence. The re-sequencing engine discards or re-sequences the received data packet based on a predetermined

threshold level of distance, the threshold level of distance being a function of the amount of memory in the system that is available for re-sequencing data packets).

Claim 9. Salamat further teaches *scheduling means coupled to the determination means for selecting one of the in-process data packets to be output* ([0012] system including an ingress side, an egress side, handling data packets received at the egress side. egress side of the system receiving an out of sequence data packet, a re-sequencing engine of the system measures the distance between the sequence number associated with the out of sequence data packet and the sequence number of the last packet that was received in sequence. The re-sequencing engine discards or re-sequences the received data packet based on a predetermined threshold level of distance, the threshold level of distance being a function of the amount of memory in the system that is available for re-sequencing data packets).

Claim 11 (as dependent on claim 2). Salamat further teaches *the means for allocating comprise a free buffer list to allocate a free temporary storage location to each received data packet* ([0012] system including an ingress side, an egress side, handling data packets received at the egress side. egress side of the system receiving an out of sequence data packet, a re-sequencing engine of the system measures the distance between the sequence number associated with the out of sequence data packet and the sequence number of the last packet that was received in sequence. The re-sequencing engine discards or re-sequences the received data packet based on a predetermined

threshold level of distance, the threshold level of distance being a function of the amount of memory in the system that is available for re-sequencing data packets).

Claim 22. Salamat further teaches *writing the packet sequence number of each received data packet that is not the next in sequence, the write address being identified by the storage location allocated to said each received data packet ([0010] receiving and re-sequencing out-of-order data packets, memory space to store a sequence and compare it against incoming data packets).*

Salamat does not teach writing in a Content Addressable Memory, the source identifier, the priority level.

In the same field of endeavor, Bryers discloses *writing in a Content Addressable Memory ([0550] CAM), the source identifier ([0559]), the priority level ([0551]).*

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Bryers with Salamat, thus modifying Salamat to include a CAM with specific routing details, to properly provide network services.

Claim 23. Salamat does not teach *the predefined parameters include Priority Level, Routing Index and Source Identifier.*

In the same field of endeavor, Bryers discloses *the predefined parameters include Priority Level ([0551]), Routing Index ([0155]) and Source Identifier ([0559]).*

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Bryers with Salamat, thus modifying Salamat to include a CAM with specific routing details, to properly provide network services.

8. Claim 12 (as dependent on claim 1) is rejected under 35 U.S.C. 103(a) as being unpatentable over Salamat, in view of Sasagawa as applied to claim 1 above, and further in view of Yen (US 20020150097 A1).

Claim 12 (as dependent on claim 1). Salamat does not teach *the data packets comprise unicast and multicast data packets*.

In the same field of endeavor, Yen discloses *the data packets comprise unicast and multicast data packets* ([0005]).

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Yen with Salamat, thus further modifying Salamat to include unicast and multicast data packets, so that teleconferencing, videoconferencing and connection-oriented communications are enabled.

9. Claim 12 (as dependent on claim 2) is rejected under 35 U.S.C. 103(a) as being unpatentable over Salamat, in view of Sasagawa, further in view of Bryers as applied to claim 2 above, and further in view of Yen.

Claim 12 (as dependent on claim 2). Salamat does not teach *the data packets comprise unicast and multicast data packets*.

In the same field of endeavor, Yen discloses *the data packets comprise unicast and multicast data packets* ([0005]).

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Yen with Salamat, thus further modifying Salamat to include unicast and multicast data packets, so that teleconferencing, videoconferencing and connection-oriented communications are enabled.

10. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Salamat, in view of Sasagawa as applied to claims 1 above, and further in view of Beshai (US 20020083195 A1).

Claim 14. The references applied to the parent claim teach *ingress adapter*.

Salamat does not teach *means for load balancing the data packets over a plurality of independent switching planes*.

In the same field of endeavor, Beshai teaches ([0122]) use of service-rate controls to ensure that a multi-channel link are appropriately loaded, balancing of data traffic load across the channels of each multi-channel link emanating from each source node, ensure that the queueing delay at the input ports of each of the multiple switching

planes is negligible) *means for load balancing the data packets over a plurality of independent switching planes.*

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Beshai with Salamat, thus further modifying Salamat to include load balancing over a plurality of independent switching planes the data packets, to keep delays to a minimum.

11. Claims 24-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Salamat, in view of Bryers.

Claim 24. Salamat teaches ([0010] receiving and re-sequencing out-of-order data packets, comparison against sequence numbers associated with packets already received and successfully sequenced. memory space to store a sequence and compare it against incoming data packets) *a method comprising: providing a plurality of registers with each register associated with a flow* ([0039] re-sequencing engine performs operations on distinct traffic streams) *providing a table with each entry associated with a register within said plurality of registers; receiving a packet; searching the table with parameters selected from the packet; if a match is found, correlating at least one parameter identified in a register associated with said matching entry with parameter in the packet to determine sequence of said packet relative to a packet identified in said associated register* ([0012] re-sequencing engine of the system measures the distance between the sequence number associated with the out of sequence data packet and the

sequence number of the last packet that was received in sequence. level of distance, amount of memory in the system that is available for re-sequencing data packets).

Salamat does not teach *a cross reference table*.

In the same field of endeavor, Bryers discloses *a cross reference table* ([0550] content addressable memory).

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Bryers with Salamat, thus modifying Salamat to include a CAM with specific routing details, to properly provide network services.

Claim 25. Salamat does not teach *if a match is not found making a new entry for said packet in said cross reference table and associating a register from said plurality of registers with said packet*.

In the same field of endeavor, Bryers discloses *if a match is not found making a new entry for said packet in said cross reference table and associating a register from said plurality of registers with said packet* ([0550] content addressable memory).

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Bryers with Salamat, thus modifying Salamat to include a CAM with specific routing details, to properly provide network services.

Claim 26. Salamat further teaches *if the packet is in sequence with packet identified in said associated register setting a valid bit to post request for service to egress scheduler ([0012] system including an ingress side, an egress side, handling data packets received at the egress side).*

Claim 27. Salamat further teaches *if packet is out of sequence relative to the packet identified within said associated register reset a valid bit indicating no request is posted to egress scheduler ([0012] handling data packets received at the egress side. The re-sequencing engine discards or re-sequences the received data packet).*

Claim 28. Salamat teaches ([0010] receiving and re-sequencing out-of-order data packets, comparison against sequence numbers associated with packets already received and successfully sequenced. memory space to store a sequence and compare it against incoming data packets) *a program product comprising: a computer readable medium encoded with computer readable code, said computer readable code including a first instruction module with instructions to examine a packet and extract a set of predefined parameters therefrom; a second instruction module with instructions that use the extracted predefined parameters to search a table having a plurality of entries with each entry associated with a different ([0010] the memory space to store a sequence, [0028] sequence space in the form of memory 94 which is allocated for storing sequence numbers of data packets received by the egress board 40, [0037] the egress board 40 to store the data packet, [0039] distinct traffic streams) register; a third*

instruction module having instructions that correlate parameters in said packet with parameters stored in an associated register to determine sequence of said packet to packet identified in said register if a match is found between the extracted predefined parameter ([0039] perform operations on 64 distinct traffic streams) and an entry in said table ([0012] re-sequencing engine of the system measures the distance between the sequence number associated with the out of sequence data packet and the sequence number of the last packet that was received in sequence. level of distance, amount of memory in the system that is available for re-sequencing data packets).

Salamat does not teach an index table.

In the same field of endeavor, Bryers discloses an index table ([0550] content addressable memory).

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Bryers with Salamat, thus modifying Salamat to include a CAM with specific routing details, to properly provide network services.

Claim 29. *Salamat does not teach a fourth instruction module including instructions for adding an entry for said packet to the index table if a match is not found.*

In the same field of endeavor, Bryers discloses a fourth instruction module including instructions for adding an entry for said packet to the index table if a match is not found ([0550] content addressable memory).

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Bryers with Salamat, thus modifying Salamat to include a CAM with specific routing details, to properly provide network services.

12. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Salamat, in view of Bryers, and further in view of Beshai.

Claim 30. Salamat teaches ([0010] receiving and re-sequencing out-of-order data packets, comparison against sequence numbers associated with packets already received and successfully sequenced. memory space to store a sequence and compare it against incoming data packets) *an apparatus comprising: a system for ensuring packets are in predefined sequence, said system including a register stack wherein each register is associated with a different flow of a multi flow system ([0039] re-sequencing engine performs operations on distinct traffic streams); a table having a plurality of entries with each entry associated with a different register is said register stack ([0039] distinct traffic streams); and a controller that selects parameters from a received packet to search the table and determine sequence of said packet relative to a packet identified in a register associated with a match entry ([0012] re-sequencing engine of the system measures the distance between the sequence number associated with the out of sequence data packet and the sequence number of the last packet that*

was received in sequence. level of distance, amount of memory in the system that is available for re-sequencing data packets).

Salamat does not teach *a cross reference index table*.

In the same field of endeavor, Bryers discloses *a cross reference index table* ([0550] content addressable memory).

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Bryers with Salamat, thus modifying Salamat to include a CAM with specific routing details, to properly provide network services.

Salamat does not teach *a plurality of switching planes; a buffer for storing packets transported through said switching planes*.

In the same field of endeavor, Beshai teaches ([0122] use of service-rate controls to ensure that a multi-channel link are appropriately loaded, balancing of data traffic load across the channels of each multi-channel link emanating from each source node, ensure that the queueing delay at the input ports of each of the multiple switching planes is negligible) *a plurality of switching planes; a buffer for storing packets transported through said switching planes*.

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Beshai with Salamat, thus further modifying Salamat to include a plurality of switching planes, to keep delays to a minimum.

Allowable Subject Matter

13. Claims 10, 15, 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 10: base claim 1, intervening claims 7, 9.

Claim 15: base claim 1, intervening claims 13, 14.

Claim 21: base claim 16, intervening claims 18, 19.

14. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

Response to Arguments

15. Applicant's arguments with respect to amended claims have been considered but are moot in view of the new ground(s) of rejection. Additional mappings are provided to match the new limitations.

16. The argument on page 21 section E is unclear. The limitation pointed to in the last paragraph "*a plurality of output registers (540) dynamically assigned to store received data packets from one of a plurality of flows*" is not in claim 1.

17. The argument on page 22 first paragraph is unclear. The limitation pointed to "*means (510) using predefined parameters for pointing to an output register storing the received data packets from said selected flow*" is not in claim 1.

18. The argument on page 22 second through fourth paragraphs is regarding the limitation "*means using predefined parameters for pointing to an output register*".

Examiner respectfully points out that this limitation has been amended claim 1 lines 9-10 "*means, using predefined parameters, for pointing to an output register*" and has been presented for examination, for the first time, in the instant communication.

19. See below regarding the argument on page 22 last paragraph.

20. The argument on page 23 third paragraph starting on line 9 is that the "*a plurality of output registers (540) dynamically assigned to store received data packets from one of a plurality of flows*" is not fairly suggested by the combination of references.

Examiner respectfully points out that this limitation is not present in claim 1.

21. A second argument on page 23 fourth paragraph is regarding the limitation "*means (510) using predefined parameters for pointing to an output register storing the received data packets from said selected flow*". Examiner respectfully points out that this limitation is not in claim 1.

22. The last argument on page 23 last paragraph continuing through page 24 first paragraph and page 24 second paragraph - and entire page 25 through page 26 middle of the page - is regarding the claims dependent on amended claim 1. Since the dependent claims incorporate all of the limitations of the base claim - a new combination of limitation has been presented for examination in the instant communication.

23. The argument on page 22 last paragraph and page 24 third and last paragraphs, starting on line 12, is regarding the limitation of claim 16 "*(610) extracting predefined parameters; using the predefined parameters to search a memory and identifying a*

cross reference index therefrom; using the cross reference index associated with each received data packet to point to respective output register previously assigned to the corresponding flow of each receive data packet;". Examiner respectfully points out that the limitation above is not the same as the amended limitation of claim 16 lines 6-13.

24. The main argument on page 26, starting on the middle of the page, regarding claim 24 is that *"it would take much more than ordinary skill in the art to combine the CAM disclosed in Bryers with Salamat in order to render Claim 24 obvious"* (last paragraph first three lines). Examiner respectfully points out that the references have been combined to produce a *cross reference table*. A technology team comprising hardware and software engineers would be able to readily construct a module that would produce a *cross reference table*.

25. A next argument on page 26, starting five lines from the bottom, is that the limitations of claim 24 lines 2-8 *"providing a plurality of registers with each register associated with a flow:*

providing a cross reference table with each entry associated with a register within said plurality of registers;

receiving a packet;

searching the cross reference table with parameters selected from the packet"

are not fairly suggested by the combination of references. Examiner respectfully disagrees. The portions of the references pointed to include: ([0010] receiving and re-sequencing out-of-order data packets, comparison against sequence numbers associated with packets already received and successfully sequenced. memory space

to store a sequence and compare it against incoming data packets), ([0039] re-sequencing engine performs operations on distinct traffic streams), ([0012] re-sequencing engine of the system measures the distance between the sequence number associated with the out of sequence data packet and the sequence number of the last packet that was received in sequence. level of distance, amount of memory in the system that is available for re-sequencing data packets). The applicant's argument did not specifically point out how the claimed limitations distinguish themselves over the listed prior art. As seen above the prior art teaches "distinct traffic streams". A person having ordinary skill in the multiplex art knows that "distinct traffic streams" and "flows" are technically equivalent. Prior art teaches "memory space to store a sequence and compare it against incoming data packets". A person having ordinary skill in the electrical and computer engineering art knows that "memory" and "computer registers" are interrelated concepts and knowing one renders the other one obvious.

26. The argument, on page 27 first full paragraph, regarding claims dependent on claim 24, is unclear since no specific limitation has been pointed to.

27. The argument on page 27 third paragraph (starting on line 14) is unclear since the recited portion of claim 28 "*a second instruction module with instructions that use the predetermined extracted predefined parameters to search an index table having multiple entries with each of said multiple entries associated with a different register*" is not in the claim 28.

28. The argument on page 28 is that the amended limitation in amended claim 30 (lines 7-11) has not been rendered obvious in an anticipatory fashion by the previous

office action. Examiner respectfully points out that the limitation being argued is a new limitation that has just been presented in the instant communication.

Conclusion

29. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **HOOMAN HOUSHMAND** whose telephone number is (571)270-1817. The examiner can normally be reached on Monday - Friday 8am - 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. H./
Examiner, Art Unit 2465

/Alpus H. Hsu/
Primary Examiner, Art Unit 2465